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**Comparative Susceptibility of 3 Species of Sturgeon  
to the White Sturgeon Herpesvirus Type 2 (WSHV-2)**

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### **Introduction**

The white sturgeon herpesvirus type 2 (WSHV-2) is a pathogenic agent isolated from both clinical disease outbreaks in juvenile and from asymptomatic adult broodstock white sturgeon. The virus is enzootic among captive populations in N. California. The origin of the virus is most certainly feral fish used as broodstocks. Recently, the virus has been isolated directly from feral white sturgeon in the Columbia River. Under experimental conditions the virus has been shown to infect and induce mortality in juvenile white sturgeon but the susceptibility of other sturgeon species has not been examined. In this study we compared the susceptibility of white sturgeon (*Acipenser transmontanus*), Atlantic sturgeon (*Acipenser oxyrinchus*) and shovelnose sturgeon (*Scaphirhynchus platorhynchus*) to a known dose of WSHV-2 under experimental conditions.

### **Materials and Methods**

The species, number, origin and mean weight of 3 sturgeon species were: white sturgeon, 25 fish/treatment, UC Davis, (24.5 g), Atlantic sturgeon, 30 fish/treatment, USFWS Lamar PA, (16.8 g) and shovelnose sturgeon, 30 fish/treatment, USFWS Bozeman MT (19.3 g). One of two replicate groups of each species was exposed to 800 tissue culture infective doses 50% (TCID<sub>50</sub>) of WSHV-2 strain UCD3-30 for 30 min. The second replicate group was exposed only to tissue culture fluids without virus. Fish were maintained in 130 L aquaria receiving flow through well water at 63°F. Mortalities were examined for presence of virus and selected fish were titrated for virus concentration per gram of tissue. The duration of the study was 43 d.

### **Results**

Mortality was highest among shovelnose sturgeon, lesser with white sturgeon and only 1 Atlantic sturgeon died (43 d) following exposures to WSHV-2 (Table 1). Dying fish had clinical signs of infection, including hemorrhagic lesions and ulcers on both dorsal and ventral surfaces and particularly pronounced around the mouth. Virus was recovered from all fish that died following virus exposure. No mortality occurred in control groups nor was virus isolated when the fish from these groups were examined at the end of the study at 43 d. Virus was recovered from exposed sturgeon that were survivors: 6/10 white sturgeon, and 3/3 shovelnose sturgeon at 43 d that showed no signs of infection. Two Atlantic sturgeon with lesions at 43 d were virus positive but no virus was detected among 10 healthy appearing exposed Atlantic sturgeon examined at the same time. The concentrations of WSHV-2 recovered from the skin of dead fish reached 10<sup>7</sup> TCID<sub>50</sub>/g among white and shovelnose sturgeon.

Table 1. Mortality among 3 species of sturgeon exposed to the white sturgeon herpesvirus type -2 (WSHV-2) under experimental conditions.

| Species             | Mortality (%) | Virus Recovered from Survivors |
|---------------------|---------------|--------------------------------|
| White sturgeon      | 9/25 (36)     | 6/10                           |
| Shovelnose sturgeon | 24/30 (80)    | 3/3                            |
| Atlantic sturgeon   | 1/30 (3)      | 2/12 (symptomatic fish)        |

## Conclusions

These experimental studies indicate that shovelnose and Atlantic sturgeon are susceptible to WSHV-2 but that there is a great difference in their response to the virus. Shovelnose appear to be more sensitive to experimental infections than white sturgeon and Atlantic sturgeon show a greater resistance to infection although they do become infected. Mortality occurs at the water temperatures used (63°F) beginning 14 d post exposure and peaking at 18 d for shovelnose sturgeon. White sturgeon began dying at day 24 but mortality had subsided by day 28. Only 1 Atlantic sturgeon died at day 43. After mortality ceased fish for the most part were normal in appearance but were found to carriers of the virus in both the white and shovelnose species. Two Atlantic sturgeon had skin lesions at day 43 and virus was recovered from these fish but not among 10 exposed but healthy appearing fish. These results show that we may expect a wide range of susceptibility among different sturgeon species to viral agents isolated from white sturgeon.